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PHOTOGRAPHIC INTERPRETATION REPORT



COMPARISON OF TYPE IIID  
LAUNCH FACILITIES AT  
MR/IRBM AND ICBM  
COMPLEXES

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INSTALLATION OR ACTIVITY NAME					COUNTRY	
Comparison of Type IIID Launch Facilities at MR/IRBM and ICBM Complexes					UR	
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		NEGATION DATE (if required)
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REQUIREMENT		NPIC PROJECT
GMAIC. 03-70-C09-86,005		250631

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Complex	Geographic Coordinates
Derazhnya	49-23-50N 027-27-40E
Pervomaysk	47-58-30N 030-56-30E

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**ABSTRACT**

During the summer of 1969, type IIID launch sites, previously associated solely with ICBM complexes, were identified at the Derazhnya MRBM and Pervomaysk IRBM Complexes. An examination of all available photography of this single-silo construction at the Derazhnya and Pervomaysk complexes revealed no significant differences between these sites and those constructed at ICBM complexes. Silo construction techniques, associated support facilities, and ground support equipment all appear identical to those which are found at ICBM complexes. The only differences observed pertain to site orientation and a slightly larger site support building found at Derazhnya and Pervomaysk.

Included in this report are a comparison of the physical features of the Derazhnya and Pervomaysk sites with those of the sites found at ICBM complexes, comparative photographs of these type IIID launch sites, and annotated photographs of support facilities and associated equipment.

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## **INTRODUCTION**

In mid-1969 type IIID launch sites, normally associated with the SS-11 ICBM system, were observed at the Derazhnya MRBM and Pervomaysk IRBM Complexes. This marked the first time that SS-11-type launch sites had been deployed at other than ICBM complexes. To date 61 launch sites have been identified at the two complexes, 27 at Derazhnya and 34 at Pervomaysk. Seven of the sites at Derazhnya and ten at Pervomaysk were complete when first observed. In addition new rail-to-road transfer points (RTPs); similar to those observed at ICBM complexes with deployed SS-11 sites, are under construction at both complexes. Ground support equipment apparently identical to SS-11 equipment has also been observed at both complexes.

Because of a lack of interpretable photographic coverage over the Derazhnya MRBM Complex most of the comparative information contained in this report comes from the Pervomaysk Complex.

The Derazhnya Complex is approximately 130 nautical miles (nm) southwest of Kiev (Figure 1). Until mid-1968 it consisted of two MRBM soft sites and one MRBM hard site, providing a total of 12 launchers for the SS-4 MRBM system.

In August 1969, two type IIID single-silo launch sites were observed under construction at the Derazhnya Complex. By the end of 1969, a total of 27 silos, three of which are considered probable sites, had been identified. Seven of these sites were complete when first observed. At present, deployment has taken place north and west of the town of Derazhnya and consists of two full launch groups of ten sites each and seven other sites representing at least one other launch group. No sites were present in May 1968, the latest clear coverage of the entire complex. Deployment probably was begun in July 1968, based on an average construction time of 12-13 months for completion of typical type IIID launch sites at deployed ICBM complexes.<sup>1</sup>

In September 1969, a new RTP was observed under construction approximately 12 nm northwest of Derazhnya and 5 nm south of Derazhnya MRBM Launch Site 3, but the lack of suitable photography precludes any detailed interpretation of this facility.

The deactivation of the two soft MRBM launch sites at Derazhnya was observed in August 1969, when it was noted that nearly all of the normal equipment had been removed from launch sites 1 and 2.

The Pervomaysk IRBM Complex is approximately 85 nm north of Odessa and 170 nm southeast of Derazhnya (Figure 1). The complex originally consisted of three IRBM hard sites and a rail-to-road transfer point, providing nine launch silos for the SS-5 IRBM system deployed there.

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In April 1969, unidentified construction activity was observed near the Pervomaysk RTP. In September 1969 this activity was identified as a new rail-to-road transfer point similar to the ones observed at deployed ICBM complexes.<sup>2</sup> The facility is located near the former IRBM RTP, and in November 1969 consisted of a propellant handling area, a receiving, inspection, and maintenance (RIM) area, and a warehouse area, all of which are under construction. A type IIID training site is in an early stage of construction just southeast of the RTP. In June 1969, two type IIID launch sites were observed under construction at the complex and, by the end of 1969, 34 sites, including three possible sites and a training site, had been identified. Ten of these sites were complete when first observed. These sites represent at least five launch groups which are deployed in a semicircle ranging from approximately 28 nm northwest to 12 nm southeast of Pervomaysk.

The launch sites were not present in May 1968 and deployment was probably started in July 1968, based on an average construction time of 12-13 months for completing a typical type IIID launch site, as observed at deployed ICBM launch complexes.

## **BASIC DESCRIPTION**

### **Launch Silos**

In general, silo construction techniques observed at the two complexes appear to be similar to those employed at ICBM complexes (Figures 2-11).<sup>3</sup> At Pervomaysk, however, it appears that the construction of the sites is moving at a pace much faster than normal, as evidenced by at least five launch sites. Launch site 9 at Pervomaysk (Figures 2 and 6), for example, progressed from an excavation through completed headworks, emplacement of the silo door rails, and forming of the graded access road in a period of two months, a stage of construction normally requiring six to seven months to reach at ICBM complexes. At this accelerated pace the sites could possibly be completed in a period of six to eight months. This construction rate may exist at Derazhnya, but a lack of interpretable photography precludes such assessment. Size and appearance of several site features such as silo corings, headworks blocks, diameter of silo headworks, diameter of silo aperture, length of silo door rails, and length and width of the silo door all equate to those observed at ICBM complexes. Rectangular patterns of four small mounds have been observed at the complete or nearly complete launch sites at Derazhnya and Pervomaysk. As at the ICBM complexes, the mounds are approximately 100 meters (328 feet) apart and the intersection of diagonals between the mounds is over the silo. The support buildings at the launch sites appear to be similar to those observed at ICBM sites with the exception that they appear to be approximately 2 meters (7 feet) longer.

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The most obvious difference between the type IIID sites at Derazhnya and Pervomaysk and those at ICBM complexes is the site orientations of 250 degrees at Derazhnya and 225 degrees at Pervomaysk. Generally the launch sites at the ICBM complexes are oriented on a northerly azimuth. The MRBM launch sites at Derazhnya are oriented on an azimuth of approximately 220 degrees and the IRBM launch sites at Pervomaysk vary from 165 to 265 degrees.

At least ten of the completed launch sites at Pervomaysk have features within the secured area identified as being for deceptive measures. These consist of dummy roads, dummy buildings, and at least four of the sites have a probable dummy tank 10 meters (33 feet) in diameter (Figures 10 and 14). One possible explanation for these deceptive measures is that the Pervomaysk area is on a direct commercial air route between Kiev and Odessa. Deceptive measures using various patterns have been observed at many of the IIID sites in deployed ICBM complexes.

Deployment of the sites at Derazhnya and Pervomaysk is following a typical pattern of ten silos and an associated control facility per launch group, as observed at ICBM complexes. As of October 1969, at least three groups had been started at Derazhnya, although only two control sites have been identified. At Pervomaysk three control sites have been identified; however, the number and location of sites observed there indicates at least five groups are present. Lack of high-resolution photography precludes any detailed interpretation of the control facilities.

### **Support Facilities**

In March 1969, a high-frequency receiving facility was identified at the Derazhnya complex. This facility, designated Khmelnitskiy MR/IR Division HF Receiving Communications Facility, was first seen under construction in May 1968 and was complete when identified. Facilities of this type are present at 17 other MR/IR division headquarters. Other than having been constructed during the same time period, there does not appear to be any association with the type IIID silo deployment at Derazhnya.

At the Pervomaysk RTP, the only one having photographic coverage suitable for detailed interpretation, the most advanced area of construction is the propellant handling facility, where two large arch-roofed buildings are under construction adjacent to the propellant off-loading points along the rail spur which served the facility. Similar buildings have been identified as propellant storage buildings at deployed ICBM complexes, with one being for fuel storage and the other for oxidizer storage. The identification of the fuel and oxidizer portions of the facility has been made through the association of ground support equipment (GSE) observed there. This GSE will be discussed in detail below. If construction procedures continue to

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follow those observed at the propellant facilities at ICBM complexes, two smaller arch-roofed buildings can be expected to appear, probably in the open area south of the two larger buildings. Two dual-basin sumps have already been completed just south of this open area. Similar arrangements are observed at the ICBM complexes. The overall layout of this propellant handling facility is, in fact, very similar to the one at the Kostroma ICBM Complex.

The only construction observed in the RIM facility is the foundation for a probable inspection building and some open ditches. In the warehouse area, four large buildings are under construction and foundations for at least three smaller buildings are observed. Buildings similar to the four larger ones are observed at the Tatishchevo ICBM Complex.

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The rail spur at the old IRBM RTP has been lengthened and now serves an open storage area supporting the new construction activity. Construction materials observed there include prefabricated headworks blocks for type IIID silos, concrete arches for arch-roofed buildings, tanks that are associated with control sites, and the smaller tanks that are buried at launch sites.

### **Ground Support Equipment**

Ground support equipment which appears to be the same type as that used in the SS-11 ICBM system<sup>4</sup> has been identified at both the Derazhnya and Pervomaysk complexes. At Derazhnya such equipment was observed parked at MRBM launch site 1 in August 1969 (Figure 12) and consisted of four missile transporters, two silo loaders, five oxidizer transporters, and three fuel transporters. Size and configuration of the equipment appear to be identical to SS-11 ICBM ground support equipment.

SS-11 type GSE was first seen at Pervomaysk in April 1969 but was not identified as such until June when the first type IIID launch sites were identified at

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the complex. In April, the equipment consisted of two canvas-covered missile transporters which were parked in the support facility at IRBM launch site 1, and in June at the same area two missile transporters were again present, along with an SS-11 type-silo loader, five oxidizer transporters, and three fuel transporters.

On September coverage of the Pervomaysk RTP (Figure 13) several pieces of GSE and missile-associated rail cars were observed at different areas within the facility. At the rail-to-road off-loading point two  long missile rail cars were at the end of the rail spur and two SS-11-type missile transporters were in the general area. In addition, nine similar missile rail cars were on the rail spur, just outside of the RTP. In the propellant handling facility, two triple-domed tank cars, two single-domed tank cars, and a probable locomotive were alongside the fuel off-loading points. Two fuel transporters and a transfer van were on the road serving the fuel side of the facility. On the oxidizer side of the facility, eight pieces of rail equipment, consisting of six triple-domed tank cars, one single-domed tank car, and a locomotive were at the off-loading points where two oxidizer transporters were

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positioned, apparently receiving oxidizer from the triple-domed tank cars. Three other oxidizer transporters and a transfer van are parked at various points on the service road adjacent to the oxidizer storage building under construction there.

[REDACTED] a fuel transfer operation was observed underway at launch site 8 (Figure 14), a completed type IIID launch site. The positioning and appearance of the equipment involved in the operation correspond to that which has been observed at type IIID launch sites which are ICBM associated.<sup>5</sup> At the site, a fuel transporter was in position at the northeast corner of the silo and a transfer van was parked

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alongside the transporter. The silo door was open and a canister top, [REDACTED] [REDACTED] was visible in the silo. Parked on the opposite side of the silo were two decontamination vans, a probable nitrogen truck, and a small unidentified vehicle. An SS-11-type silo loader, a nitrogen van, and two unidentified vans are parked on the turn-around portion of the site access road.

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### Training Site

A type IIID silo was identified under construction near an MRBM/IRBM training site at the Leningrad SSM Training Facility<sup>6</sup> in September 1968, marking the first time such facilities have been observed together. The site was first observed in a midstage of construction in June 1968 and was probably started in February of that year. Subsequent photography revealed that the site is a training site similar to those observed at type IIID ICBM complexes. A technical support area is located just west of the site and contains buildings similar to those in rail-to-road transfer points at ICBM complexes.

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